DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 14th, 2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-6, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko et al. (US 6,291,132) in view of Bawendi et al. (US 6,774,361), and further in view of Fuller et al. ("Ink-Jet Printed Nanoparticle Microelectromechanical Systems," Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002, disclosed in IDS).

Regarding claim 1:

Glushko discloses:

A method of storing data comprising:

placing a plurality of fluorescent elements at each of a plurality of data pit locations on a rotating data storage medium to represent data (column 12, lines 35-50);

exciting said fluorescent elements at each location by making them fluoresce (column 12, line 50 to column 13, line 5);

measuring said fluorescence of said fluorescent elements at each location to identify presence and absence (column 13, line 45-65).

Glushko does not disclose:

(A) wherein said fluorescent elements are:

nanometer beads filled with nanometer sized particles, the nanometer sized particles providing colors to the nanometer beads;

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified.

(B) wherein the nanometer beads are placed using inkjet technology.

Regarding (A):

Bawendi discloses:

fluorescent elements that are nanometer beads filled with nanometer sized particles (column 14, lines 15-50), the nanometer sized particles providing colors to the nanometer beads (column 6, lines 25-65);

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified (e.g., column 5, lines 45-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko wherein the fluorescent elements are nanometer beads

filled with nanometer sized particles, the nanometer sized particles providing color to the nanometer beads, as taught by Bawendi, where it is the colors within said beads that are excited and the presence and absence of said colors that is identified.

The rationale is as follows:

Both Glushko and Bawendi are directed to using fluorescent materials to record information.

Glushko discloses using fluorescent dye to record information.

Bawendi specifically discusses using fluorescent dyes to store information (column 3, lines 5-15) and discloses that quantum dots are superior (column 3, lines 5-40).

One of ordinary skill could have combined the known improvement taught by Bawendi with the disclosure of Glushko and achieved predictable results.

Regarding (B):

Glushko in view of Bawendi does not disclose wherein the nanometer beads are placed using inkjet technology.

Fuller discloses wherein nanometer beads are placed using inkjet technology (page 54: last two paragraphs).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed suing inkjet technology.

The rationale is as follows:

Fuller demonstrates that inkjet technology is a known method for depositing nanometer beads. Fuller discloses that is advantageous (page 54).

One of ordinary skill could have combined the teaching of Fuller with that of Glushko in view of Bawendi and achieved predictable results.

Regarding claim 3:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said nanometer sized particles are nanometer sized fluorescent particles (taught by Bawendi as discussed above).

Regarding claim 4:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said nanometer sized particles comprise quantum dots (taught by Bawendi as discussed above).

Regarding claim 5:

Glushko in view of Bawendi, and further in view of Fuller, does not explicitly disclose:

wherein said quantum dots are made up of red, blue, and green color.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller, wherein said quantum dots are made up of red, blue, and green colors.

The rationale is as follows:

Bawendi teaches that the quantum dots are made up of multiple colors (each "discrete emission" of column 6, lines 45-55 is a separate color).

There is a finite set of colors, of which red, blue and green are prominent examples. One of ordinary skill could have pursued the known potential solutions and chosen red, blue, and green with a reasonable expectation of success.

Regarding claim 6:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein said quantum dots are made of a plurality of shades of a color (column 6, lines 45-55: if there may be twenty separate discrete emissions at least some must be a plurality of shades of a color, since there are less than twenty major colors).

Regarding claim 12:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein placing a plurality of nanometer beads at each of a plurality of data pit locations comprises placing a plurality of said nanometer beads in each data pit location, the nanometer sized particles providing colors to each nanometer bead, wherein the beads placed in a same data pit location are different from one another (Bawendi teaches using a group of quantum dots of "one or more" sizes, as per column 9, line 58 to column 10, line 15. Each size dot is a different color).

Regarding claim 13:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein the beads placed in the same data pit location are colored with different colors (as per the discussion in the rejection of claim 12).

Regarding claim 14:

Glushko in view of Bawendi, and further in view of Fuller, discloses:

wherein the beads placed in the same data pit location are colored with different shades of a color (as discussed in the rejection of claim 6).

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and further in view of Fuller, as applied to claim 1 above, and further in view of Metz (US 5,166,813).

Regarding claim 10:

Glushko in view of Bawendi, and further in view of Fuller, discloses a method for storing data as discussed above in the rejection of claim 1.

Glushko in view of Bawendi, and further in view of Fuller, does not disclose "wherein a HSMF is used for dispersing collimated fluorescent light on a spectrally sensitive component."

Metz discloses that when detecting fluorescence, a holographic multi-spectral filter is used for dispersing collimated fluorescent light on a spectrally sensitive component (the abstract discloses the use of a holographic filter; Fig. 1 depicts the light impacting the spectrally sensitive component; column 12, lines 40-50 discloses that the hologram can be multi-spectral: that is, it transmits more than one wavelength). Metz discloses that a holographic filter is more efficient (column 13, lines 1-15).

It would have been obvious to one of ordinary skill at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller a holographic multi-spectral filter as taught by Metz.

The combination would have been predictable to one of ordinary skill in the art; the motivation would have been to be more efficient.

5. Claims 11 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and futher in view of Wenzel ("Shaping nanoparticles and their optical spectra with photons," Applied Physics B, pags 513-517, October 20th, 1999; cited in applicant's specification).

Regarding claim 11:

This claim is identical to claim 1 except that the nanometer beads are placed "using laser-induced technology."

As above, the base reference Glushko does not teach the nanometer beads or the means of placing them.

The nanometer beads are taught by Bawendi; the analysis was discussed in detail in the rejection of claim 1.

Regarding the means of placing the beads:

Glushko in view of Bawendi does not disclose wherein they are placed "using laser-induced technology."

Wenzel discloses using laser-induced technology to place quantum dots (e.g., Conclusions, page 516).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed using laser-induced technology.

The rationale is as follows:

Wenzel teaches a known technique to place nanoparticles.

One of ordinary skill in the art could have combined it with the teaching of Glushko and Bawendi and achieved predictable results.

Regarding claims 15-17:

These claims are similar to claims 12-14. These elements in Bawendi were identified in the rejection of those claims and do not change in the combination used for these claims. No further elaboration is necessary.

Response to Arguments

6. Applicant's arguments filed 14th April 2010 have been fully considered but they are not persuasive.

For convenience and ease of understanding, the section numbers in applicant's arguments will be used.

Sections 2.1 and 2.2 merely summarize the previous arguments.

In section 2.3, applicant argues that Bawendi discloses reading the spectral emission of a collection of quantum dots. Applicant "ask[s] the Examiner to show where does [sic] Bawenedi teach how to break and separate the collective information provided in Bawendi into separate beads to be inserted into the cells of Glushko." Applicant argues that separated the collective information of Bawendi would "clearly and impermissibly frustrate the principle of operation of Bawendi."

With all due respect, it's not clear why applicant believes the combination wouldn't work. All that is required is substituting the quantum dots taught by Bawendi for the fluorescent material used in Glushko. Applicant has not identified any reason why this substitution wouldn't be within the ability of one of ordinary skill in the art.

In any case, the question is not whether Bawendi's disclosed operation would be frustrated, but whether Glushko, the base reference, would still work after substituting the quantum dots taught by Bawendi. The preponderance of evidence suggests that it would.

Not that despite applicant's repeated arguments against "collective information," applicant's own invention has "collective information" in each location. See, for example, applicant's Fig. 1, where clearly there is a collection of quantum dots in each data location.

Glushko already has individual data locations. All the combination requires is using the same sort of "collection of quantom dots" (as applicant terms it) taught by Bawendi in multiple data locations on the medium instead of in a single bar code as in Bawendi alone. There's no special teaching required. No special method to "break and separate" Bawendi's dots is necessary. The exact collection of quantum dots used in Bawendi to make a bar code can be used in the combination to put information in each data location.

In section 2.4, applicant argues that "the cells of Glushko, being adapted for receiving molecules, are unadapted to receive" the nanometer sized particles. In response, applicant doesn't provide any reason why Glushko's data location couldn't be used for quantum dots. The only difference is a trivial one of size of the particles. Certainly one of ordinary skill in the art is capable of adapting to particles of a different size.

Next, applicant returns to Bawendi. Applicant observes that Bawendi only puts particles in one location on an item and argues that Bawendi doesn't teach a plurality of beads in a plurality of data pit locations.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In this particular case, multiple data pit locations, etc., are taught by Glushko. Bawendi is only relied upon to teach using quantum dots for the fluorescent particles instead of the particles used by Glushko.

In section 2.5, applicant argues that Bawendi does not talk about color. See, for example, Bawendi column 6, lines 25-65. Note that the "spectral emission wavelength" of the quantum dot is the color of the quantum dot. The wavelength emitted by something is the color that it emits: for example, 440 nm is the color blue.

Therefore when Bawendi analyzes the spectral emission of the quantum dots, Bawendi is analyzing the color, and checking for the presence of or absence of a certain color. Applicant does the exact same thing in their own invention.

In section 2.6, applicant again criticizes Bawendi for not disclosing a plurality of data pits, etc., as in the claim. Again, applicant is attacking Bawendi separately, but one cannot show nonobviousness by attacking references individually where the rejections are based on a combination of references.

Again, Glushko discloses the plurality of data pit locations. Bawendi is only relied on to substitute the superior fluorescent material (quantum dots) for the one used by Glushko.

In section 2.7, applicant argues that there's no motivation to combine the references. However, Bawendi discloses that quantum dots are a superior fluorescent material. That's more than reason enough to substitute them for the fluorescent material used by Glushko.

In sections 3.1 and 3.2, applicant discusses their new claims.

The arguments here are similar to the ones already discussed. Applicant's arguments are directed toward Bawendi not teaching individual data pit locations. As has already been discussed, Glushko teached individual data pit locations. All that Bawendi is relied on for is substituting quantum dots for the material used in Glushko.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER R. LAMB whose telephone number is (571)272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Christopher R Lamb/
Examiner, Art Unit 2627